



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,346	07/27/2001	David G. Grier	40563/137	1222
27433	7590	07/13/2004	EXAMINER	
FOLEY & LARDNER 321 NORTH CLARK STREET SUITE 2800 CHICAGO, IL 60610-4764			FINEMAN, LEE A	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

KW

Office Action Summary

Application No.

09/917,346

Applicant(s)

GRIER, DAVID G.

Examiner

Lee Fineman

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-32 is/are pending in the application.
- 4a) Of the above claim(s) 10-22, 25-27 and 29-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 23-24, 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/27/01 & 8/17/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5 February 2004 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Grier et al, U.S. Patent No. 6,055,106.

Grier et al. disclose a microscope system (fig. 6) for examination of a sample (trapped particles in 50) comprising a source for a laser beam (12); a diffraction medium/component (DOE) which interacts with the laser beam to produce a plurality of laser beams (column 4, lines 30-36) which interact simultaneously with a plurality of sample volumes (trapped particles in 50); an optical component, having a focusing lens (20) with an input plane (24) to apply the plurality of laser beams to the sample (fig. 6); the optical component further including an optical arrangement causing the plurality of laser beams to pass through a central region (B) of the input plane of the focusing lens,

Art Unit: 2872

said input plane having an associated optical axis (fig. 6) with the input plane centered on the optical axis (fig. 6) and each axis of each of the plurality of laser beams coinciding with the optical axis in the input plane (fig. 6, column 5, lines 1-7) thereby enabling formation of a diffraction-limited focus for spots formed by the plurality of laser beams (diffraction-limited focus is inherent in optical trapping) and a means for detecting light/detector to sense light beams scattered from the sample (unnumbered imaging optics in so far as at least an eye will detect the image). The preamble fails to structurally limit the body of claim. Grier et al. meets all of the structural limitations required by the claim in support thereof. As such, Grier et al. must support being confocal in the same way as the structure of the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grier et al. in view of Vaez-Iravani, U.S. Patent No. 6,208,411 B1.

Grier et al. disclose the claimed invention except for wherein the detector comprises a pixellated area detector, a position-sensitive image-forming photodetector, a charge coupled device (CCD) or a photodetector array. Vaez-Iravani teaches a confocal microscope system (fig 1.) for examination of a sample (106) comprising a source for a

Art Unit: 2872

laser beam (101); a diffraction medium (102) which interacts with the laser beam to produce a plurality of laser beams (column 4, lines 42-52); an optical component, having a focusing lens (105); and a detector (108) to sense light beams scattered from the sample wherein the detector comprises a position-sensitive image-forming photodetector (column 5, lines 8-14), a charge coupled device (CCD), which is a pixellated area detector or a photodetector array.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add any of the detectors suggested by Vaez-Iravani to the system of Grier et al. to be able to detect a large area while also independently detecting each spot (Vaez-Iravani, column 5, lines 8-14).

6. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grier et al in view of Vaez-Iravani as applied to claim 4, and further in view of Horikawa, U.S. Patent No. 5,331,456.

Grier et al in view of Vaez-Iravani as applied to claim 4 disclose the claimed invention except for the position-sensitive image-forming photodetector comprises a complementary metal-oxide-semiconductor (CMOS) detector or microchannel plate. Horikawa teaches that a CCD, a CMD (a charge modulation device which is a CMOS), or a microchannel plate (column 1, lines 52-54) are art-recognized equivalents in the microscope art. It would have been obvious to one of ordinary skill in the art at the time the invention was made use any of the above detectors in the system of Grier et al in view of Vaez-Iravani to detect the image.

Art Unit: 2872

7. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaez-Iravani in view of Grier et al.

Vaez-Iravani disclose in fig. 1 a method of performing confocal microscopy on a sample (106) comprising the steps of providing a laser beam (101); applying the laser beam to a diffraction medium (102) having a preselected diffractive pattern (column 4, lines 41-52); outputting a plurality of diffracted laser beams from the diffraction medium, the diffracted laser beams having their spatial orientation defined by the preselected diffractive pattern (fig. 1); applying the plurality of diffracted laser beams to particular volume regions of the sample (106) corresponding to the selected diffraction pattern (column 4, lines 56-67); passing the diffracted laser beams through an input plane (back side of 105) of a focusing lens (105) with the input plane having an associated optical axis (fig. 1) and the input plane centered on the optical axis (fig. 1); and sensing light beams received from the particular volume regions of the sample (column 5, lines 1-14). Vaez-Iravani discloses the claimed invention except for all the laser beams passing through a center region of the input plane wherein each axis of each of the plurality of laser beams coinciding with the optical axis in the input plane thereby bringing each of the diffracted laser beams to a diffraction-limited focus. Grier et al. teaches a microscopy system (fig. 6) in which diffracted laser beams (fig. 6) are passed through a center region (B) of an input plane (24) of a focusing lens (20) with the input plane having an associated optical axis (fig. 6) and the input plane centered on the optical axis (fig. 6) and each axis of each of the plurality of laser beams coinciding with the optical axis in the input plane (fig. 6, column 5, lines 1-7) thereby bringing each of the diffracted laser beams to a diffraction-limited focus (diffraction-limited focus is inherent in optical

Art Unit: 2872

trapping). It would have been obvious to one of ordinary skill in the art at the time the invention was made to pass each of the laser beams in the system of Vaez-Iravani through the focusing lens in the way taught by Grier et al. to provide even smaller confocal spots and therefore better, sharper images.

Response to Arguments

8. Applicant's arguments with respect to claims 1-8, 23, 24 and 28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Finer et al., U.S. Patent No. 5,512,745 has optical trapping with diffraction-limited focus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Art Unit: 2872

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LAF

July 8, 2004


MARK A. ROBINSON
PRIMARY EXAMINER